AMENDMENTS TO THE CLAIMS:

This listing of the claims will replace all prior versions, and listings, of the claims in this application.

Claims 15, 16, 62-65 are canceled herein without prejudice or disclaimer.
Claims 2-12, 17, 20-24, 40 and 59 were previously canceled without prejudice or disclaimer.
Claims 66-71 are newly added.

Listing of Claims:

1. (Currently Amended) A method, comprising:

receiving a composite wireless communication signal by a receiver ~~from each of at least two spatially separated transmit antennas associated with at least one transmitter or from at least two transmitters~~;

splitting a corresponding complex composite base band received signal into an inphase domain portion and a quadrature domain portion; and

performing, on ~~a~~ the split corresponding complex composite base band received signal, ~~comprised of real modulation signals, complex modulation signals or a combination of real and complex modulation signals, a~~ joint signal detection separately in inphase domain and quadrature domain, where the joint signal detection comprises performing pre-filtering and reduced state sequence estimation separately on the inphase domain portion and the quadrature domain portion, where the composite wireless communication signal comprises a desired signal and an interfering signal, where the joint signal detection operates to suppress interference from the interfering signal ~~of a real modulation alphabet and a complex modulation alphabet wherein the joint detection includes at least one of channel-shortening, joint pre-filtering and joint reduced state sequence detection of real and imaginary parts of signals, from a single receive antenna branch or from a plurality of receive antenna branches; and~~

~~determining at least one of the following:~~

~~whether operation of the receiver is in a first mode in which an interfering signal is directed to a different receiver; and~~

~~whether operation of the receiver is in a second mode in which a desired signal and an interfering signal are processed by the receiver~~.

2-12. (Canceled)

13. (Currently Amended) A system according to claim 18, in which said base station transmits two transmission signals on ~~the~~ a same channel.

14. (Currently Amended) A system according to claim 13, in which said two transmission~~s~~ signals comprise two GMSK signals, two 8pSK signals or one GMSK signal and one 8PSK signal.

15-17. (Canceled)

18. (Currently Amended) A wireless transmission system comprising:

at least one base station having at least two spatially separated antennas and at least one RF unit ~~for transmitting~~ configured to transmit ~~one of~~ a GMSK signal ~~and~~ or an 8PSK ~~transmission~~ signal along each of said two spatially separated antennas; and

at least one receiving station~~, having at least one antenna, for communicating~~ configured to communicate with said base station;

where said at least one receiving station comprises means for receiving a composite wireless communication signal, means for splitting a corresponding complex composite base band received signal into an inphase domain portion and a quadrature domain portion and means for ~~applying interference cancellation to a composite input signal comprising a combination of a first signal and a second signal interfering with said first signal, said receiving station configured to~~ performing, on ~~a~~ the split corresponding complex composite base band received signal, ~~comprised of real modulation signals, complex modulation signals or a combination of real and complex modulation signals, a~~ joint signal detection separately in inphase domain and quadrature domain, where the means for performing joint signal detection is further for performing pre-filtering and reduced state sequence estimation separately on the inphase domain portion and the

quadrature domain portion, where the composite wireless communication signal comprises a desired signal and an interfering signal, where the joint signal detection operates to suppress interference from the interfering signal ~~of a real modulation alphabet and a complex modulation alphabet wherein the joint detection includes at least one of channel-shortening, joint pre-filtering and joint reduced state sequence detection of real and imaginary parts of signals, in which said receiving station comprises means for evaluating the modulation type of an interfering signal and for estimating channel parameters of said interfering signal;~~

~~in which said channel parameters of said interfering signal are estimated by calculating channel parameters for all combinations of a desired signal and of said interfering signal and selecting the channel parameters that meet a criterion~~.

19. (Currently Amended) A wireless transmission system comprising:

at least one base station having at least one antenna and at least one RF unit ~~for transmitting~~ configured to transmit ~~one of~~ a GMSK signal ~~and~~ or an 8PSK ~~transmission~~ signal; and

at least one receiving station~~, having at least one antenna, for communicating~~ configured to communicate with said base station;

where said receiving station comprises means for receiving a composite wireless communication signal, means for splitting a corresponding complex composite base band received signal into an inphase domain portion and a quadrature domain portion and means for ~~applying interference cancellation to a composite input signal comprising a combination of a first signal and a second signal interfering with said first signal, said receiving station configured to~~ performing, on ~~a~~ the split corresponding complex composite base band received signal, ~~comprised of real modulation signals, complex modulation signals or a combination of real and complex modulation signals, a~~ joint signal detection separately in inphase domain and quadrature domain, where the means for performing joint signal detection is further for performing pre-filtering and reduced state sequence estimation separately on the inphase domain portion and the quadrature domain portion, where the composite wireless communication signal comprises a desired signal and an interfering signal, where the joint signal detection operates to suppress interference from the interfering signal ~~of a real modulation alphabet and a complex modulation~~

~~alphabet wherein the joint detection includes at least one of channel-shortening, joint pre-filtering and joint reduced state sequence detection of real and imaginary parts of signals, in which said receiving station comprises means for evaluating the modulation type of an interfering signal and for estimating channel parameters of said interfering signal; and~~

~~further comprising means for detecting at least one of the following:~~

~~whether said system is in a first transmission mode in which said interfering signal is directed to a different receiver and~~

~~whether said system is in a second transmission mode in which said first signal and said second signal are both to be processed by the receiving station; and processing said second signal in accordance with said detected transmission mode~~.

20-24. (Canceled)

25. (Currently Amended) The method of claim 1, where the corresponding complex composite base band received signal is comprised of real modulation signals, complex modulation signals or a combination of real and complex modulation signals, where the real modulation signal is a GMSK signal, ~~and where receiving includes~~ the method further comprising rotating the ~~received signals~~ corresponding complex composite base band received signal in complex space such that the GMSK signal is binary modulated.

26. (Currently Amended) The method of claim 1, where the corresponding complex composite base band received signal ~~is a sum comprised of~~ comprises at least one GMSK signal, the method further comprising de-rotating the corresponding complex composite base band received signal with a factor $e^{-j\phi_k}$ such that the ~~component~~ at least one GMSK signal is forced to be binary modulated.

27. (Currently Amended) The method of claim 26, ~~further comprising~~ where splitting the corresponding complex composite base band received signal comprises splitting ~~the I and Q parts of~~ the de-rotated corresponding complex composite base band received signal.

28. (Currently Amended) The method of claim 1, further comprising de-rotating the corresponding complex composite base band received signal, where de-rotating and ~~I-Q~~ splitting ~~the base band signal to~~ yield modulation formats comprising binary, ~~real~~ inphase domain and ~~imaginary~~ quadrature domain data streams.

29. (Currently Amended) The method of claim 1, where ~~joint~~ pre-filtering comprises using a set of feed forward weights to minimize an error term that includes ~~an I-Q~~ a MIMO feedback filter, wherein a feed forward filter separately filters ~~real~~ the inphase domain portion and the quadrature domain portion ~~imaginary parts of baseband data collected from at least one receive antennas~~.

30. (Currently Amended) The method of claim 29, where ~~joint~~ pre-filtering comprises optimizing filter coefficients according to a minimum mean square error (MMSE) criterion.

31. (Currently Amended) The method of claim 1, where reduced state sequence ~~detection~~ estimation comprises use of a reduced state soft output sequence estimation ~~to jointly detect I-Q symbol streams~~ that employs a branch metric comprised of ~~I-Q~~ inphase domain and quadrature domain components of the ~~composite~~ corresponding complex composite base band received signal.

32. (Currently Amended) The method of claim 1, where said steps of receiving, splitting and performing ~~configured~~ are performed in an 8PSK blind I-Q interference suppression receiver when a GMSK interferer is present.

33. (Currently Amended) The method of claim 1, where said steps of receiving, splitting and performing ~~configured~~ are performed in a GMSK-8PSK or 8PSK-GMSK I-Q MIMO minimum mean square error (MMSE) joint detection receiver.

34. (Currently Amended) The method of claim 1, where said steps of receiving, splitting and performing ~~configured~~ are performed in an 8PSK-8PSK I-Q MIMO minimum mean square error (MMSE) receiver that jointly detects at least two 8PSK signals and rejects residual GMSK

interference using I-Q whitening.

35. (Currently Amended) The method of claim 1, where said steps of receiving, splitting and performing ~~configured~~ are performed in a GMSK-GMSK I-Q MIMO minimum mean square error (MMSE) receiver that jointly detects at least two GMSK signals and rejects residual GMSK plus 8PSK interference using I-Q whitening.

36. (Previously Presented) The method of claim 1, further comprising sequentially estimating desired and dominant interfering signal channel impulse responses, where channel estimation blindly identifies a dominant interferer modulation type and its training sequence.

37. (Previously Presented) The method of claim 36, where modulation identification comprises use of $e^{j\pi k/2}$, $e^{j3\pi k/8}$ constellation rotations associated with GMSK and 8PSK modulations, respectively, and where training sequence identification comprises use of an estimation metric over a plurality of possible interference training sequence pairs.

38. (Currently Amended) The method of claim 36, where identifying the ~~signal~~ dominant interferer modulation type and training sequence comprises searching through known training sequences, and analyzing residual signals to identify a type of dominant interference.

39. (Previously Presented) The method of claim 1 further comprising, sequentially estimating interfering modulation type and training sequence, and performing a maximum likelihood joint channel estimate after all modulation types and training sequences are estimated.

40. (Canceled)

41. (Currently Amended) The method of claim 1, further comprising detecting whether operation of the device is in a first mode in which the interfering signal is to be discarded or in a second mode in which the desired signal and the interfering signal are to be processed as data, where~~in~~ in the first mode~~,~~ the interfering signal is discarded.

42. (Currently Amended) A device comprising:

a receiver configured ~~to be coupled to at least one receive antenna~~ to receive a composite wireless communication signal ~~transmissions sent from at least two spatially separated transmit antennas, the transmissions comprising a real modulation transmission and a complex modulation transmission, said receiver~~; and

a processor ~~further~~ configured to split a corresponding complex composite base band received signal into an inphase domain portion and a quadrature domain portion and to ~~operate~~ perform, on ~~a~~ the split corresponding complex base band received signal, ~~comprised of the real modulation and complex modulation received signals to perform a~~ joint signal detection separately in inphase domain and quadrature domain, where the joint signal detection comprises performing pre-filtering and reduced state sequence estimation separately on the inphase domain portion and the quadrature domain portion, where the composite wireless communication signal comprises a desired signal and an interfering signal, where the joint signal detection operates to suppress interference from the interfering signal ~~of a real modulation alphabet and a complex modulation alphabet wherein the joint detection includes at least one of channel-shortening, joint pre-filtering and joint reduced state sequence detection of real and imaginary parts of the signals, said receiver yet further configured to determine at least one of the following:~~

~~whether operation of the receiver is in a first mode in which an interfering signal is directed to a different receiver and~~

~~whether operation of the receiver is in a second mode in which a desired signal and an interfering signal are processed by the receiver~~.

43. (Previously Presented) The device of claim 42, where said receiver is coupled to a plurality of receive antennas.

44. (Currently Amended) The device of claim 42, where the corresponding complex composite base band received signal is comprised of real modulation signals, complex modulation signals or a combination of real and complex modulation signals, where the real modulation signal is a GMSK signal, and where said ~~receiver~~ processor is further configured to rotate the ~~received~~

~~signals~~ corresponding complex composite base band received signal in complex space with a factor such that the GMSK signal is binary modulated.

45. (Currently Amended) The device of claim 42, where the corresponding complex composite base band received signal comprises at least one GMSK signal, and where said ~~receiver~~ processor is further configured to de-rotate the corresponding complex composite base band received signal with a factor $e^{-j\phi_k}$ such that ~~component~~ the at least one GMSK signal is forced to be binary modulated.

46. (Currently Amended) The device of claim 45, where the processor splitting the corresponding complex composite base band received signal comprises the processor ~~said receiver is further configured to~~ splitting ~~the I and Q parts of~~ the ~~re~~de-rotated corresponding complex composite base band signal.

47. (Currently Amended) The device of claim 42, where said ~~receiver~~ processor is further configured to de-rotate the corresponding complex composite base band received signal, where de-rotating and ~~I-Q~~ splitting the corresponding complex composite base band signal by the processor ~~to~~ yield modulation formats comprising binary, real and imaginary data streams.

48. (Currently Amended) The device of claim 42, where performing pre-filtering by said ~~receiver~~ processor ~~is further configured to jointly pre-filter by~~ comprises using a set of feed forward weights to minimize an error term that includes ~~an I-Q~~ a MIMO feedback filter.

49. (Currently Amended) The device of claim 48, where performing pre-filtering by said ~~receiver~~ processor ~~is further configured to jointly pre-filter by~~ comprises optimizing filter coefficients according to a minimum mean square error (MMSE) criterion.

50. (Currently Amended) The device of claim 42, where ~~said receiver is further configured to~~ performing reduced state sequence ~~detection~~ estimation by the processor comprises ~~by use of~~ performing a reduced state soft output sequence estimation procedure ~~to jointly detect I-Q symbol~~

~~streams~~ using a branch metric comprised of ~~I-Q~~ inphase domain and quadrature domain components of the ~~composite~~ corresponding complex composite base band received signal.

51. (Currently Amended) The device of claim 42, where said receiver and said processor ~~is~~ are configured as an 8PSK blind I-Q interference suppression receiver when a GMSK interferer is present.

52. (Currently Amended) The device of claim 42, where said receiver and said processor ~~is~~ are configured as a GMSK-8PSK or 8PSK-GMSK I-Q MIMO minimum mean square error (MMSE) joint detection receiver.

53. (Currently Amended) The device of claim 42, where said receiver and said processor ~~is~~ are configured as an 8PSK-8PSK I-Q MIMO minimum mean square error (MMSE) receiver operable to jointly detect at least two 8PSK signals and to reject residual GMSK interference using I-Q whitening.

54. (Currently Amended) The device of claim 42, where said receiver and said processor ~~is~~ are configured as a GMSK-GMSK I-Q MIMO minimum mean square error (MMSE) receiver operable to jointly detect at least two two GMSK signals and to reject residual GMSK interference using I-Q whitening.

55. (Currently Amended) The device of claim 42, where said ~~receiver~~ processor is further configured to sequentially estimate desired and dominant interfering signal channel impulse responses, where channel estimation blindly identifies a dominant interferer modulation type and its training sequence.

56. (Currently Amended) The device of claim 55, where modulation type identification comprises use of $e^{j\pi k/2}$, $e^{j3\pi k/8}$ constellation rotations associated with GMSK and 8PSK modulations, respectively, and where training sequence identification comprises use of an estimation metric over a plurality of possible interference training sequence pairs.

57. (Currently Amended) The device of claim 55, where said ~~receiver~~ processor is configured to identify the ~~signal~~ dominant interferer modulation type and training sequence using a search through known training sequences, and an analysis of residual signals to identify a type of dominant interference.

58. (Currently Amended) The device of claim 42, where said ~~receiver~~ processor is further configured to sequentially estimate interfering modulation type and training sequence, and to perform a maximum likelihood joint channel estimate after all modulation types and training sequences are estimated.

59. (Canceled)

60. (Currently Amended) The device of claim ~~42~~68, where in the first mode~~,~~ the interfering signal is discarded.

61. (Currently Amended) A system according to claim 18, in which two transmission signals are transmitted by ~~the~~ a same base station using two antennas or are transmitted by a plurality of base stations each using one antenna.

62-65. (Canceled)

66. (New) The device of claim 42, where the composite wireless communication signal is received by the receiver from each of at least two spatially separated transmit antennas associated with at least one transmitter or from at least two transmitters.

67. (New) The device of claim 66, where the receiver receives desired information from each of the at least two spatially separated transmit antennas.

68. (New) The device of claim 67, where the processor is further configured to detect whether

operation of the device is in a first mode in which the interfering signal is to be discarded or in a second mode in which the desired signal and the interfering signal are to be processed as data.

69. (New) The device of claim 42, where the composite wireless communication signal comprises two signals that are received on a same channel and where the two signals comprise two GMSK signals, two 8PSK signals or one GMSK signal and one 8PSK signal.

70. (New) The device of claim 42, where the processor is further configured to estimate channel parameters of the interfering signal by calculating channel parameters for all combinations of a desired signal and of said interfering signal and selecting the channel parameters that meet a criterion.

71. (New) The device of claim 42, where the receiver is further configured to receive channel parameters of an interfering signal.